

ENDPOINT DETECTION IN CHEMICAL-MECHANICAL POLISHING OF PATTERNED WAFERS HAVING A LOW PATTERN DENSITY

Abstract

A chemical-mechanical polishing (CMP) system and method includes pumping polishing slurry from a CMP apparatus through a sampling tube to an endpoint detection apparatus during a polishing operation, and flushing the sampling tube while a polishing operation is not in progress. The flushing of the sampling tube is commenced in accordance with a control signal from the endpoint detection apparatus terminating the polishing operation; the flushing is terminated in accordance with a starting signal to the CMP apparatus. The pump, which pumps a sample of slurry into the endpoint detection apparatus, continuously pumps slurry and/or water. Clogging of the slurry sampling tube is thus eliminated, thereby ensuring robust operation of the CMP apparatus. Contamination of the sampling tube is also avoided, so that the system may reliably provide sensitive endpoint detection and pro-

cess control, even when a film of low pattern density is polished.